

GRADE 6

Goal 3: The learner will build an understanding of the geologic cycles, forces, processes, and agents which shape the lithosphere.

Objective 3.05 Analyze soil properties that can be observed and measured to predict soil quality including

- Color
- Horizon profile
- Infiltration
- Soil temperature
- Structure
- Consistency
- Texture
- Particle Size
- pH
- Fertility
- Soil Moisture

*FLP Lesson – **Perc Through the Pores** (3-6): Hands-on and kinesthetic activities to illustrate the difference in the 3 soil particles (sand, silt, clay) and how these differences affect soil texture, porosity, and water-holding capacity.*

Objective 3.06 Evaluate ways in which human activities have affected Earth's pedosphere and the measures to control the impact.

- Vegetative cover
- Agriculture
- Land use
- Nutrient balance
- Soil as a vector

*FLP Lesson – **Till We Or Won't We?**: Experiments to simulate rain on a field to investigate how soil preparation and tillage techniques and mulches affect soil erosion and water runoff. Introduction to modern best management practices used by farmers (and homeowners and developers) to reduce erosion and to protect soil productivity and water quality.*

*FLP Lesson – **What Will the Land Support?**: A board game simulating land use and changes and their effects on the land's carrying capacity and illustrating the relationship between population Growth and environmental effects.*

*FLP Lesson - **Soil Is Not Trivial** (5-12): Using facts from the Dust Bowl, students write questions and play a trivia game focused around the national soil conservation program and the importance of soil. Students then explore and/or develop a plan to address a local soil conservation issue.*

Goal 4: The learner will investigate the cycling of matter.

Objective 4.03 Describe the flow of matter and energy in natural systems.

*FLP Lesson – **From Apple Core to Healthy Soil** (2-8): A composting experiment to investigate how temperature, water, and soil microbes work together in soil to decompose organic matter.*

Objective 4.03 Examine evidence that green plants make food.

*FLP Lesson – **Gifts from the Sun**: Kinesthetic exploration of the complex interactions of water, sunlight, chlorophyll, and gases that takes place in the process of photosynthesis.*

*FLP Lesson – **Root, Root for Life**: Six learning stations to explore the function and importance of roots to plants, animals, and people. Concludes with a root-tasting feast.*

Objective 4.04: Evaluate the significance of photosynthesis to other organisms.

*FLP Lesson – **Lunchtime Favorites**: A Venn diagram activity to trace the source of food to learn the interdependence of plants, animals, and people. Biological classifications of food items.*

Goal 5 The learner will build an understanding of the Solar System.

Objective 5.01 Analyze the components and cycles of the solar system including:

- Sun
- Seasons
- Day/year

*FLP Lesson – **Gifts from the Sun**: Kinesthetic exploration of the complex interactions of water, sunlight, chlorophyll, and gases that takes place in the process of photosynthesis.*

*FLP Lesson- **Seasons Through the Year** (Prek-6): To build an awareness of seasonal changes, students use their own birthdays, a comparison of seasons in different hemispheres, and self-made books.*

Goal 7 The learner will conduct investigations and use technologies and information systems to build an understanding of population dynamics.

Objective 7.03 Explain how changes in habitat may affect organisms.

Objective 7.04 Evaluate data related to human population growth, along with problems and solutions:

- Waste disposal
- Food supplies
- Resource availability
- Transportation
- Socio-economic patterns

FLP Lesson – **Six Billion and Still Growing!**: Calculating and graphing historical and projected population data to understand that human populations grow exponentially and to examine the many circumstances affecting birth and death rates.

*Lesson – **Piecing Together Population Patterns**: Analysis of selected demographic data from various countries and world regions. Group research and oral presentations on FLP how a country's population statistics affect the country's food, economics, and natural resources.*

*FLP Lesson – **Trash Bashing** (1-12): By conducting a small group sorting activity, students learn the importance of reducing, reusing, and recycling solid waste. Students then develop plans to change personal behaviors.*

Objective 7.05 Examine evidence that overpopulation by any species impacts the environment.

*FLP Lesson – **Less Elbow Room**: A simulation of the progressive crowding over time as a population grows exponentially. Discussion of how violation of one's personal space can alter behavior.*

*FLP Lesson – **Cows or Condos?**: A case study reading that uses a problem solving model to understand the complex issues of urbanization of agricultural land.*

GRADE 7

Goal 4 The learner will conduct investigations, use models, simulations, and appropriate technologies and information systems to build an understanding of the complementary nature of the human body systems.

Objective 4.07 Explain the effects of environmental influences on human embryo development and human health including (smoking, alcohol, drugs, and diet).

*FLP Lesson – **Mighty Macros** (6-12): Students conduct simple food experiments and collect data about their personal food choices to learn how the foods they eat satisfy the body's nutritional needs for macronutrients: carbohydrates, proteins, and lipids.*

GRADE 8

Goal 2 The learner will demonstrate an understanding of technological design.

Objective 2.02 Use information systems to:

- Identify scientific needs, human needs, or problems that are subject to technological solution
- Locate resources to obtain and test ideas

*FLP Lesson – **Go, Go, H O!** (6-8): students design, create, experiment with, and evaluate the effectiveness of an artificial system of moving water from a source to an area of need, as in irrigation.*

Goal 3 The learner will conduct investigations and utilize appropriate technologies and information systems to build an understanding of the hydrosphere.

Objective 3.08 Recognize that good health of environments and organisms requires:

- Monitoring the hydrosphere
- Water quality standards
- Stewardship

*FLP Lesson – **Don't Use It Up!** (Pre K- 12): A sponge demonstration visually illustrating human consumption of freshwater (a finite resource) and the positive effect of conservation measure to protect the quantity of freshwater.*

Goal 4 The learner will conduct investigations and utilize technology and information systems to build an understanding of chemistry.

Objective 4.02 Evaluate evidence that elements combine in a multitude of ways to produce compounds that account for all living and nonliving substances.

*FLP Lesson – **Gifts from the Sun** (4-8): Kinesthetic exploration of the complex interactions of water, sunlight, chlorophyll, and gases that takes place in the process of photosynthesis. Understanding of the chemical changes that take place in photosynthesis develops as students role play the reactants and products in this reaction.*

Objective 4.10 Describe risks and benefits of chemicals including:

- Medicines
- Food preservatives
- Crop yield
- Sanitation

*FLP Lesson – **Managing Pests** (8-12): Students analyze the advantages and disadvantages of pest-management techniques and use a problem solving model to evaluate alternatives for specific pest management issues.*

Goal 5 The learner will conduct investigations and utilize appropriate technologies and information systems to build an understanding of evidence of evolution of organisms and landforms.

Objective 5.05 Use maps, ground truthing and remote sensing to make predictions regarding:

- Land Use
- Urban Sprawl
- Resource Management

*FLP Lesson – **Cows or Condos?** : A case study reading that uses a problem solving model to understand the complex issues of urban sprawl.*

*FLP Lesson - **Your School Ground Through New Eyes** (3-12): Students develop and sharpen skills of observation to discover new details about their school ground and form fresh perceptions of their outdoor space*

Goal 7 The learner will conduct investigations, use models, simulations, and appropriate technologies and information systems to build an understanding of microbiology.

Objective 7.02 Describe diseases caused by microscopic biological hazards including;

- Viruses
- Bacteria
- Parasites
- Contagions
- Mutagens

*FLP Lesson - **Could It Be Something They Ate?** (3-8): Students experiment with the growth of microbes and predict who could become ill from eating contaminated food by analyzing the food-handling behavior of a group of picnickers.*

*FLP Lesson – **Germ Busters** (K-12): Through a controlled experiment, students learn one way bacteria can be spread and the importance of hand washing for personal hygiene and food safety.*

Objective 7.05 Investigate aspects of biotechnology

- Specific genetic information available
- Careers
- Economic impact to NC
- Ethical issues
- Impact for agriculture

*FLP Lesson – **To Whom It May Concern**(6-12): After conducting research, students write a letter expressing their opinion (based on specific facts) about a controversial issue. The issue example given in the activity concerns the labeling of genetically engineered food.*